

THE AMERICAN JOURNAL OF
OPHTHALMOLOGY.

VOL. XV.

JUNE, 1898.

NO. 6.

ORIGINAL ARTICLES.

THE SCIENCE OF OPHTHALMOLOGY.¹

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THE science of ophthalmology is in great danger of becoming tainted with loose methods of approximation. It is related of Friar Bacon, who invented spectacles, that he ground his own lenses. Keppler, to whom the world is indebted for many discoveries in astronomy, elaborated and simplified the methods of grinding lenses, and they came at once into general use. The original plan was based upon the idea that the maximum angle of refraction in a spherical body expressed the unit. The quadrant of the sphere being the unit, had its focal length in the radius, minus the interruption of the passage of light through the lens, this being great or small, according to the index of refraction of the media used for making lenses. If the radius of the sphere from which the

¹Read before the Third Annual Meeting of the Western Ophthalmological and Oto-Laryngological Association, held at Chicago, Ill., April 7-8, 1898.

unit was derived were twelve inches, the focal length of the unit would be twelve inches, minus the resistance of the medium to the passage of light. For spectacle lenses, the radius of the unit, it has been agreed, should be one inch, or twenty-five millimeters. Now, if we adopt the English inch, the French inch, or the Prussian inch, all of which are materially different, we should, of course, have the lenses in these systems made of fractional parts of the unit, and as this is the quadrant of a sphere, focal lengths would have to be measured by the same system of determining the radius; and so it was, in former times, the custom of the English speaking people, the French, and North Germans, to employ systems peculiarly their own.

In an attempt to popularize this branch of science, and to give it common characters which would be acceptable to all nations, the International Ophthalmological Congress of 1867, on motion of Professor Javal, appointed a committee to investigate the merits of the different systems of grading lenses, and report some method which should be universally acceptable. That committee fixed upon the plan of grading lenses by focal lengths, and established the meter as the unit of measure, and fixed the whole series required for a complete case of test lenses with definite inter-focal spaces. It had already been noted that, in the fractional system of gradation, although based upon the radius of curvature of the refracting surface, the lenses were required to exhibit uniform refracting power, and as different media were employed for making the lenses, and different units of measure to determine their radii, constant disparity appeared in the results of their application. The eyes of persons having but slight errors of refraction, and especially in cases of astigmatism, refused to be comforted by the best directed attempts at correcting their refraction, and so, Giraud-Teulon conceived the difficulty must be in the ocular muscles. He practiced decentering the lenses, and claimed great advantage from their use.

In 1868, Dr. Hermann Scheffler concluded, from the favorable reports of the use of decentered lenses, that each lens should be made periscopic, in order to measure uniformly the whole outer field of vision. His work on the "*Theorie der Augenfehler und der Brille*" presents a thoroughly scientific analysis of the refracting powers of prismic, spheric and cylin-

dric bodies, separately, and in combination, in their varied application to the correction of errors of refraction in the eye.

Paetz and Flohr (Berlin), practically abandoned the radius of curvature, and introduced a series of test lenses graded by focal lengths, adopting the Prussian inch as the standard. The prismic base of each lens in the series constituted an orthoscopic combination. The prisms were designated in degrees, minutes, and seconds, according to the angular deviation of the light passed through them. This, it was supposed, would yield such precisely accurate results in grinding lenses as to enable the optician to give each of them the proper periscopic form. Then it became necessary to still have recourse to the capacity of the eye to unite parallel rays of light in a uniform angle to determine at the same time their acuity of perception.

With the definite sized test letters of Snellen came a uniform distance for positive infinity, or parallel light. Now, if the Prussian inch determined the unit of refraction in the lenses, it is manifestly clear the Prussian linear measure must be employed to fix the point of positive infinity. As Snellen constructed his test lenses at first, upon the basis of English measure, it is natural that great dissatisfaction in France and Germany should have arisen upon the adoption of a system foreign to their own.

When the metric system of gradation was finally agreed upon, Snellen re-calculated the relations in the size of his test letters for the new point of positive infinity, fixed at six meters. However much we may incline to criticise the want of accuracy in the methods of grinding lenses, and the merits of the meter as a unit of measure, we must allow that its adoption necessarily does away with a large percentage of those errors incident to our former lack of uniformity in the units of measure.

Inasmuch as the distance at which the test object is placed for measuring the capacity of the eye to unite parallel rays of light has been fixed at six meters, and the relative acuity of vision is expressed in angular measure, it is manifestly clear that neither more nor less than six meters shall be employed to represent the distance, and that no other terms than those of the relative angle of visual perception shall be used to record the result. Neither vulgar fractions should be employed, nor any inharmonious system of notation.

Of the scientific toys designed to afford cheap and easy methods of evading the exacting demands of the details of a circumstantial analysis, not one of them can do away with the necessity for an accurately graded series of test lenses, the complete suspension of the accommodation of the eye to be tested, and the geometrically graded test objects, placed at the point of positive infinity.

It will not do to say that David O'Flaherty, with accommodation suspended in his right eye, sees with $+ 2.00 \text{ D.} = \frac{1}{v_1}$ of normal; yet this is a good illustration of a very common mode of expression. A very valuable contribution on the clinical uses of certain cycloplegics is marred by the statement of a metrical lens required to secure vision $= \frac{30}{xx}$.

The science of ophthalmology can not be preserved in its concrete form if such matters as these escape our attention. It is not to be wondered that disappointment so frequently follows loose methods of analysis as to lead both patient and practitioner astray in searching for causes of pains and aches that refuse to yield to the supposed correction of errors of refraction.

The decentered lens and the prism have seized upon the minds of some, whilst others have apparently gone daft in their search for ocular tendons to cut, or advance. An enthusiastic surgeon has recently reported his achievements in the looping of ocular tendons with catgut ligatures. Our confrère, Dr. Geo. T. Stevens, has created an apparently rational place for partial tenotomy; but it is not an uncommon occurrence to read of a dozen or more tenotomies, or advancements of the tendons in a single eye. With the tendon looped, muscular co-ordination in the movement of the eyes might, in all probability, be expected to observe not alone the lateral, the vertical, and the rotary movements, but, like the famous gun with the curved barrel made to shoot bears behind trees, turned in all sorts of irregular directions to compensate for the eccentricities of opposing tendons.

A fine illustration of the results of painstaking practice is presented in the person of Mrs. T., aged 30 years, the wife of a prominent practitioner in Louisville. She came to me on October 19, 1896, with divergent squint, photophobia, indistinct vision for distance, and total inability to read. She had suffered almost continuously with sick headache for a long

time, and having been told that the ocular tendons must be advanced, her husband brought her to me with the object of having whatever operating was found necessary done at once. On attempting to suspend accommodation I found she had unsteady muscular movements, the rotary muscles being in an almost constant state of activity. Without glasses she saw nothing; with the glasses she had she saw $\frac{6}{XXXVI}$ Snellen, with the right eye, and $\frac{6}{LX}$ with the left eye. On examination of the glasses I found for the right eye she had $-0.75c.$ axis 170° $\bigcirc -0.75s.$ combined with a prism of 3° base inward. In the left eye she had $+2.00c.$ axis 110° $\bigcirc \Gamma -3.50c.$

I prescribed homatropin drops, to be instilled twice daily, and directed smoked coquilles to be worn constantly, and no attempt to be made to see objects, excepting for purposes of going about. She went to the country and remained until April 30, 1897. When she returned the eyes were re-examined, under homatropin, the use of which had been kept up during her entire absence. I found $+1.00c.$ axis 90° enabled the right eye to see $= \frac{6}{VI}$ Snellen; $+2.00c.$ axis 90° enabled the left eye to see $= \frac{6}{VI}$ Snellen. These glasses were prescribed and she has worn them constantly ever since. She is fond of reading, and having no children, has spent the past year in almost constant reading, with not more than two attacks of headache during the entire year, both of these clearly due to indigestion. The glasses she had formerly worn were chosen after a most painstaking and thorough analysis with the Javal-Schiötz ophthalmometer, the ophthalmoscope, and the DeZeng refractometer, in the hands of an experienced practitioner. It may be remarked that she narrowly escaped a series of tenotomies and advancements.

The great point to be considered is, that sufficient care should be taken to establish complete suspension of accommodation, and no final attempt to determine the state of refraction should be made for persons whose general health is such as to disqualify them from engaging in the normal use of the eyes. Proper discrimination in these matters, and a judicious course of constitutional treatment necessary to restore the patient's general health are too often overlooked or neglected.

I had intended to take an entire hour for the presentation of my subject, but your committee politely informed me, that there were others at this meeting prepared to illuminate a va-

riety of subjects, and reduced my intended great luminary to this small tallow dip.

HOMONYMOUS HEMIOPIA FOLLOWED BY TOTAL
LOSS OF VISION IN A CASE OF UTERINE
HÆMORRHAGE DUE TO FIBROID TUMOR.¹

BY A. R. AMOS, M.D., DES MOINES, IOWA.

MY main reason for presenting a paper under the above title is not so much to point out the relation of the uterine hæmorrhage to hemiopia or amblyopia, which is of sufficient frequency of occurrence not to require description in this body, but, rather because of the unusual phenomena presented in the case to be described, the nature of which is suggested in the title, and which I hope to bring out in this discussion.

The case is that of a woman, aged 50 years, who had always enjoyed good health previous to the onset of a uterine hæmorrhage which occurred nearly a year prior to any visual defect.

Questioning the patient, and physical examination revealed nothing of syphilis or tuberculosis, and no inherited tendency to brain affections. The uterine function, as stated, had always been satisfactorily performed until a year previously. During the period from the first hæmorrhage to the complaint of visual defect, her system had sustained frequent losses of blood from the uterus. The waste at first was not so great but that she was able to recover largely from one attack to the next, but gradually the increasing frequency and larger losses deprived the system of its recuperative power, leaving the relaxed vessels without power to restrain the frequently recurring blood torrent.

When seen by me about one year ago the blood showed no more than one-third the standard of red corpuscles. The features were pale, the patient extremely languid. A few days

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previously she had complained of dizziness and headache, and quite suddenly lost the power to see objects situated on her right side; she could not see beyond the middle line.

An examination of central vision showed it to be above $\frac{20}{xxx}$ in both eyes. The perimeter revealed a full field on the left in both eyes as well as good color-sense, but visual perception from her right field was abolished. The pupil reflex and accommodative power were retained. Ophthalmoscopic examination negative. There was no apparent paralysis of other nerves. The patient was irritable and fretful. The extreme palor caused inquiries as to hæmorrhage and led to the history above stated.

Suspecting uterine tumor, she was at once referred to a surgeon, with the assurance that the eye affection resulted from loss of blood. I saw no more of her until December, 1897, when she returned, being led by her husband. She had lost the power of vision in the opposite side also, and could only distinguish bright lights.

It seems that she had received ineffectual treatment for some time, and, growing dissatisfied, had been taken to Chicago, where a uterine fibroid was removed by Dr. Etheridge which checked farther loss of blood. She states that up to this time the vision had remained about as when I had last seen her, but within three days following the operation she was again attacked with dizziness and became totally blind. She was then referred to Dr. Wear, who treated her for some time. Returning to me in December, an examination of the fundus showed a slight palor of optic discs, but no changes in the vessels. The pupil reflexes were still present, but the pupils somewhat dilated. Patient was peevish and appeared somewhat stupid and childish, but had quite recovered from effects of hæmorrhage. In correspondence with me Dr. Wear wrote that he believed it to be due to embolism, but the letter did not state whether embolism was within the arteria centralis or the cerebral cortex. In order to get more information, I asked her husband to take her to Dr. Voldeng, of my own town, who made the following report: "Total absence of evidence of involvement of other cranial nerves. The symptoms point to disease of posterior lobes."

At this time she had entirely recovered from the loss of blood, was vigorous but depressed mentally. At times, espe-

cially on bright days, she believed she could see a little, but could give no definite evidence of it.

Finally, at the time of writing, an examination gives the following results: Pupillary reflexes to light good, pupils normal width. The ophthalmoscope shows normal appearance of the fundus, with possibly a slight narrowing of arteries.

Moreover, it is found that central vision has so far returned that she reads Jaeger type, No. 1, at 14 inches, but only a letter at a time. When pointing to a letter with a pencil she is unable to locate it from the pointer unless the pencil rests on the edge of the letter. Withdraw it a trifle and she sees only the letter. By searching for some time she may be made to read the distant type, ²⁰/_{LXXX}, with each eye. Beyond this central point the eye seems as blind as ever.

Now, after this brief, but I hope sufficiently explicit narration of the phenomena, what explanation can we find for them? Certainly the facts upon which to base a diagnosis are meagre, and we shall have to use them carefully or incur serious risk of missing a correct conclusion.

In discussing the cause or causes the first thing to do, apparently, is to recognize it, if possible, as functional, or due to organic changes in some portion of the visual apparatus. The patient showed hysterical stigmata, but gave no history of hysterical seizures during her past life. Hysterical amblyopia in which the peripheral field is primarily involved or where this field rapidly disappears with simultaneous fading of the central field are the forms most commonly observed and described by writers.

Occasional cases have been reported with central scotoma which appeared to be of hysterical origin, but without having had an opportunity of a thorough search of the literature of the subject, I am not aware that the phenomena observed in these cases have ever been definitely ascribed to hysteria. Let us recall for a moment the symptoms: Homonymous hemiopia, loss of all sense of vision in one half of the field, coming on suddenly and without previous complaint or suggestion, and without narrowing of the other half or any serious, though some loss of central power, followed a few months later by similar loss in the other half with abolition of central vision. These facts, both in their character and relation, in time would, it seems to me, make it unnecessary to regard farther the cau-

sal relation of hysteria in this case. It seems out of the question. And yet there is a late symptom which we may adduce as farther proof of its non-causal character, to-wit: the gradual return of visual power recently noticed, but confined to a central region not larger than five degrees in diameter. Were it hysterical, we should rather expect some striking phenomena, or possibly a reversal of the symptoms, while here we have evidence of regeneration of injured nerve structure. Extreme anæmia of the retina not due to obstructive lesion of the nerve may be considered, but it seems to me only to be rejected. This might account for amblyopia but not for hemiopia. Moreover, at no time, while under my observation, did the retina appear in that condition.

Excluding, therefore, these conditions, it seems to me we are forced to assume a lesion of some part of the visual apparatus. Moreover, if we shall recall the fact that hemiopia occurred at a time of great anæmia due to severe and repeated hæmorrhages of the uterus, and that the total loss of vision followed closely after an operation in which the uterus was removed, and at which time there was probably further loss of blood, it seems altogether probable that on both these occasions thrombi formed in some of the vessels, and becoming detached, floated into the blood streams causing embolism of some of the vessels of some part of the visual apparatus. Besides, the suddenness of the attacks would point to such a cause, while the slight shock as manifested by dizziness and headache would not point away from it.

The absence of symptoms indicating lesion of other cerebral areas, as paralyses of nerves, throws but little light on the case, merely indicating the small area of tissue involved. The part and nature of that affected is not by this means shown, but the absence of other pathological manifestations has at least the negative value of not detracting from the force of the embolic theory.

Granting, therefore, first, a lesion and second an embolic lesion, what part of the visual tract is involved?

Dr. Wear, in his communication, almost led me to believe that he regarded it as a case of embolism of the arteria centralis retinæ of both eyes. If this were his opinion he must certainly have refused to believe that there had ever been any hemiopia, for embolism of the arteria centralis causing signi-

taneous loss of vision of one half of both eyes, while conceivable is altogether improbable. Moreover, even the facts which he was able individually to observe would make it extremely improbable that the lesion occurred in the optic nerves, since simultaneous involvement of both nerves would be of very rare occurrence. Besides, there are no ophthalmoscopic indications of degeneration within the eye, and even after more than a year no evidence of degeneration has traveled down the tracts from the original lesion showing itself in the disc.

Taking the facts together, we are safe in assuming that the lesion occurred at some point back of the commissure and that in the case of the first attack with blindness of the right visual field of both eyes, we had a lesion of the left cerebral hemisphere, and in the second attack, which brought on total loss of vision, a lesion of the right cerebral hemisphere.

Referring again to the early part of this paper, we found the pupillary reflex to light intact, equally in both eyes, and since the nerves carrying these impulses go out with the optic tracts from the primary optic centers, we are able to localize the lesion above the pulvinar and the corpora geniculata. The only other point outside the cerebral cortex which might be the seat of the lesion is the posterior part of the internal capsule. This we may reasonably exclude by the absence of paralysis of motion or sensation which might fully be expected in an embolism of this region.

By this process of exclusion we may conclude that emboli of the cerebral vessels occurred in the posterior lobe in the region of the cuneus, first on the left side and several months later on the right side.

After more than a year from the first attack and nine months from the last, we find a small central area of vision, equal to about $\frac{20}{LX}$ in both eyes, but with confusion of the color-sense, while beyond that point only an imperfect light-sense remains.

In conclusion, permit me to call attention to the following interesting points:

1. The two lesions occurring at different periods of time, and involving the same portion of each cerebral hemisphere—double homonymous lateral hemiopia.
2. While at first there was loss of central vision as well as peripheral, regeneration of the area connected with the

macula lutea of one or both sides had taken place, leaving the other areas still involved.

CONJUNCTIVITIS DUE TO THE DIPLO-BACILLUS OF MORAX-AXENFELD.

BY ADOLF ALT, M.D., ST. LOUIS, MO.

A PAPER by H. Gifford in the *Annals of Ophthalmology* for April, 1898, in which reference is made to some cases seen by myself, prompts me to record them here. This seems to be more to the point, as the diplo-bacillus, so common, apparently, in some parts of Europe, has been as yet but rarely seen in this country. Gifford states, that Weeks, of New York, and myself are the only ones who have, besides himself, thus far met with this organism.

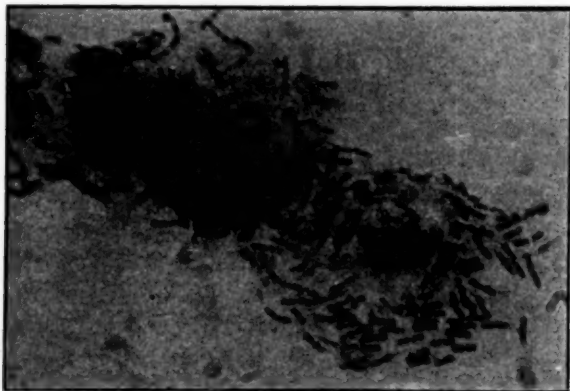
In the *Berliner Klinische Wochenschrift*, April 18, 1898, G. J. Schoute, of Leyden, takes pains to record one single case in order to show that the Netherlands, also, know this pathogenic organism.

I have seen this germ first described by Morax and Axenfeld in three cases, which differed so much from the original description of the symptoms produced by the diplo-bacillus, as given by Morax, that I thought at first, that I had to deal with the bacillus of Friedländer. In this opinion I was the more strengthened by the fact, that the three cases came to me during a severe epidemic of pneumonia and close upon each other. However, I am now satisfied from the discoloration of the bacillus by Gram's method, that I had to deal with the Morax-Axenfeld diplo-bacillus.

Morax (*Annales d'Oculistique*, January, 1897) calls the conjunctivitis produced by this bacillus a *subacute* one, Axenfeld (*Berliner Klinische Wochenschrift*, September 27, 1897) calls it a *chronic* diplo-bacillus conjunctivitis, but he mentions, that it may, in exceptional cases, appear with the symptoms of a very acute catarrhal conjunctivitis. Both of these observers, as well as Peters and Gifford, have seen complications, especially corneal ulceration.

My own cases were, then, in so far exceptional cases, as

they all came to me with symptoms of a most acute catarrhal conjunctivitis. There was very much swelling of the conjunctiva and œdema of the lids (in two of the cases of one eye only),



but a scant yellowish discharge which lodged in the inner canthus. This discharge consisted of almost a pure culture (see Figure) of a diplo-bacillus, usually two links enclosed in an undoubted capsule, sometimes three or four.

As Morax and Axenfeld have praised especially the efficacy of zinc in this affection, although the instillations have to be used for many weeks, it may be of some importance to state, that I treated these cases daily myself with a 1 per cent. solution of protargol. Under this treatment the diplo-bacillus as well as the symptoms evoked by its presence disappeared entirely in one case in fifteen, in one in twelve, and in the third case, which is still in my hands, they are now almost gone after eight days of treatment. This is a decided improvement on the zinc treatment.

In my three cases the infection seems to have been purely one with this diplo-bacillus, while others have also seen mixed infections.

The pathogenic quality of this bacillus has been tested by Gifford on his own eyes.

SOME USES OF WATER IN OPHTHALMIC PRACTICE.¹

BY E. E. HAMILTON, M.D., WICHITA, KANS.

THE uses of water in ophthalmic practice are manifold, and its purposes varied. A short paper can not do the subject justice. To the wide-awake physician, however, only suggestions are necessary, they acting as stimuli for personal investigation within library walls.

Water is used largely as a diluent and solvent. By its use we put our remedies in perfect solution, and nicely regulate their strength for local use according to indications.

Solutions of alkaloids or their salts, such as atropia, eserine, etc., are apt to deteriorate with age. Should we desire to preserve such solutions and add an antiseptic effect, they should be dissolved with a 3 or 4 per cent. solution of boric acid. Before using they should be sterilized by boiling.

These precautions should be enforced, particularly in corneal affections. In an organ so essential to vision as the cornea, we can not afford to leave anything undone to hasten recovery.

Dr. Stroschein, of Würzburg, Germany, has devised a convenient flask for boiling ophthalmic solutions, as has also Llewellyn, of Philadelphia.

Preparatory to an operation on the eye, or its appendages, the operator's hands should be thoroughly scrubbed with soap and water and then washed with an aqueous solution of bichloride of mercury (1 to 1000). The skin in the region of the operation and the conjunctival sac should be well cleansed and scrubbed with an antiseptic wash. All instruments should be put in boiling water for five minutes, and then placed in a 2 per cent. solution of carbolic acid, pure alcohol, or sterilized water until used.

Of external applications in ocular therapeutics, none are so common as water. Its effects will vary according to temperature, duration, method, and time of application.

Modern asepsis, or antisepsis, has its basis in cleanliness.

¹ Read before the South Kansas District Medical Society.

Water subserves this important purpose by reason of its property of moisture, temperature being here of secondary importance.

In the favorable modification of inflammatory processes by aqueous application, moisture, too, supplements temperature.

With perhaps few exceptions, inflammation of the eye or its appendages, is considered a result of an invasion of pathogenic bacteria. All the symptoms accompanying such attacks, as heat, redness, swelling and pain, with possible necrosis of tissue, are presumed to be manifestations of micro-organisms, plus Nature's efforts in defense in the destruction and neutralization of these noxious agencies, and the restoration of their damaging effects on living tissues.

The degree of inflammation found in a given case largely registers the virulency of the infecting germ.

As the physiological anatomy of separate eye structures differs greatly, we naturally expect in inflammation different manifestations, according to the kind of tissues involved. Such in practice is found to be the case, and with this clinical fact comes our separate indication for the temperature of the water used locally in treatment.

If it be possible to formulate rules for its use, cold would seem to be indicated:

1. In traumatisms, to prevent or control inflammation.
2. When the inflammatory process is unattended with severe pain.
3. In inflammation of parts, which is usually attended at some stage of the process with discharge of mucus or pus, or both.

Conversely, heat is indicated in opposite conditions, viz.: In the absence of recent injury, in the absence of mucus or purulent discharge, and in the presence of pain.

I realize the impossibility of establishing hard and fast rules to which there are no exceptions, but it has seemed to me the above rules afford good working guides for our practice in the use of heat and cold.

The second and third symptoms clinicians will recognize as being attendants of conjunctival, while their absence is equally as characteristic of corneal and iritic inflammation.

In ocular injuries the early and continuous use of cold constitutes our best treatment. Often it prevents inflamma-

tion. If not, cold favorable modifies its course by preventing dilatation of the vessels, limiting exudations and destroying or retarding the growth of infecting bacteria. In traumatic inflammation cold can sometimes be applied with advantage during the entire process, even when the iris and cornea are involved.

As before intimated, uncomplicated conjunctival inflammation is not attended, as a rule, with severe pain. At some stage discharge commonly occurs, which may be free and apparent, or perhaps only sufficient to glue the lids together.

The conjunctival membrane in health is quite vascular. It and its neighboring structures are composed of loosely constructed tissue which permit of much exudation and infiltration without serious tension; hence the comparative absence of pain even in cases attended with much inflammatory swelling.

We have, of course, all grades of conjunctivitis, from the mild catarrhal form with slight discharge and little swelling, to the hard, board-like infiltration and free purulency of Neisser's gonococcus. In the latter condition cold should be applied early and persistently, particularly during the stage of exudation before the occurrence of purulent discharge. During the stage of pyorrhœa we may, as the inflammatory symptoms gradually subside, relax our cold applications, using them intermittently instead of continuously.

Aqueous solutions of boracic acid (4 per cent.), or of bichloride of mercury (1 to 10,000), should be freely used, both for their antiseptic and cleansing effect. They should be repeated with more or less frequency so long as the discharge continues. If at any time severe pain should occur, it probably would mean corneal involvement, in which case heat might do better.

In milder grades of conjunctivitis cold still remains an excellent remedy, but its use need not be so continuous or the temperature so low.

During acute attacks of granular conjunctivitis, or in the relapses of chronic trachoma, cold applications favorably modify symptoms and shorten the course of the disease.

The reaction from silver nitrate, copper sulphate, and kindred applications, is much lessened if followed, for a time, with compresses soaked in ice water.

In phlyctenular conjunctivitis or keratitis in children, cold

douchings or plungings relieve the troublesome photophobia and blepharospasm, thus enabling us to make better examinations and more effective applications.

The troublesome congestion and asthenopia following attacks of conjunctivitis is greatly relieved by cold applications of ten or fifteen minutes' duration, repeated three or four times daily. They seem to stimulate the vaso-motor nerves, and help to restore tone to the parts.

I am aware that heat and moisture constrict vessels, check exudation, and destroy germs. Theoretically, their use is indicated even in conjunctival inflammation, but in practice it is exceedingly difficult to maintain the requisite degree of heat. As ordinarily used by the laity, they amount simply to warmth and moisture, the effects of which are to relax and sodden the parts and prolong recovery, besides promoting complications.

As suggested earlier, heat seems to find its strongest indication in inflammations attended with pain and unaccompanied by discharge. These conditions prevail in keratitis, iritis and cyclitis. In keratitis we have structures involved of a non-vascular, firm and unyielding character. We have an exudation of cells from surrounding vessels, their migration to the area affected, the subsequent disposition of which may be in absorption and subsidence of inflammation by resolution, or in death, with necrosis of tissue, constituting an ulcer or abscess.

Pain is usually great, and results from pressure on the ciliary nerves, or if loss of tissue, from exposure of their sensitive terminal filaments.

In iritis and cyclitis, pain is a characteristic symptom, resulting from the pressure of exudations into the substance of the iris and ciliary body and adhesions to neighboring structures.

As pain in these cases represents tension, with pressure on nerves of sensation, heat and moisture for their soothing and relaxing effect are indicated. Experience seems to prove that their intermittent use for fifteen or twenty minutes at a time, and repeated every two to three hours, gives best results. Thus applied, moisture materially aids the effect of heat in producing tissue relaxation and absorption of exudates, thus relieving tense pain.

In keratitis, heat and moisture subserve a further purpose,

in that they favor the development of new blood vessels for the occasion. These afford avenues of defense in Nature's battle for supremacy and channels for the transference of nutritive material in the repair of tissues.

In iritis, heat and moisture, immediately preceding the use of atropia, aid their absorption, thus indirectly helping to produce mydriasis and the breaking up of adhesions.

In glaucoma, heat and moisture, by relaxing tension, relieve pain and palliate the disease.

In orbital cellulitis, lachrymal abscess and styes, the persistent use of heat and moisture hastens resolution or promotes suppuration, thus shortening their course.

But little will be said of the methods of application. Cold is best applied with compresses taken from blocks of ice, and renewed with sufficient frequency to maintain the degree of cold required. Often they need to be changed once or twice a minute, and continued day and night. This means at least two nurses, who should be impressed with the responsibility of their position.

Heat is best applied with compresses taken from water, which may be used as hot as the finger will bear. It is surprising what a degree of heat can be borne with comfort and benefit.

In keratitis, water as hot as can be borne dropped directly on the cornea, has been recommended.

Eye cups have been devised to better maintain heat, or a tumbler may be used, and the eye opened, while immersed, to permit of direct corneal and conjunctival contact.

Poultices should have no place in ophthalmology. Their baneful effects on conjunctival and sub-conjunctival tissues should relegate them to the shades of eternal disuse.

Finally, water is plentiful and within the reach of all. Its intelligent use is of great value in ophthalmic practice.

SOCIETY PROCEEDINGS.

THIRD ANNUAL MEETING OF THE WESTERN OPHTHALMOLOGICAL, OTOLOGICAL, LARYN- GOLOGICAL AND RHINOLOGICAL ASSOCIATION.

Discussion on paper read by DR. ADOLF ALT, of St. Louis, entitled "*Recent Researches Into the Histo-Pathology of Trachoma*," (illustrated), which appeared in the April number of this journal.

DR. H. GIFFORD (Omaha).—Like many others, I have the idea that trachoma must be caused by some animal microbe, since the best bacteriologists who had investigated the disease have found no bacteria. So I started a search for a trachoma plasmodium, and for some time thought I had found it, but afterwards found that the same microscopical pictures could be obtained from other forms of conjunctivitis. I have not gone deeply into the mystery of trachoma and can add nothing to Dr. Alt's admirable description. That the same structural conditions should be found in trachoma and follicular conjunctivitis is not surprising. In other parts of the body the irritation produced by the most varying sorts of bacteria results in practically identical histological changes.

DR. B. E. FRYER (Kansas City, Mo.)—I wish to congratulate Dr. Alt on his paper, and to thank him for the instruction he has given me in this matter. I know the thoroughness with which he conducts his researches. The position he takes in regard to these bodies found in cases of trachoma seems to me to be very reasonable and they may be the origin of the trouble.

DR. A. ALT (St. Louis).—There is very little more for me to say on this subject. Of course it is utterly impossible for me to prove that what I have described is really the particular parasite which causes trachoma. I only judge from the regu-

larity and the often enormous frequency with which these bodies are found that they may be of more importance than has been known. When I show you to-morrow the specimens you will be astonished at the frequency with which these peculiar bodies occur in some cases of trachoma, more particularly in recent ones. I have specimens of one case in which under a low power the whole field is studded with these peculiar large cells and their derivatives.

I do not see how anybody of large experience can doubt the infectiousness of trachoma, although I know there is at least one practitioner present who denies it. I once had occasion to publish an epidemic of trachoma occurring in an orphan asylum in St. Louis in which all but three children out of sixty-five were infected with the disease from one newly entered child. At the Heidelberg Ophthalmological Congress last year, Axenfeld proved that so-called non-infectious follicular conjunctivitis is, after all, also an infectious disease, by having infected himself. The inoculation of rabbits with trachoma does not help us materially, because while we may produce the disease in these animals, it does not last. This brings me to the consideration of another point. You will remember that Burnett and a number of other gentlemen have called attention to the fact that the negroes are almost immune to trachoma. I think I have found a cause for this immunity. The negro seems to have a much greater supply of lachrymal glandular tissue than the white races. Since we know that the secretions of the body are anti-parasitic, this greater secretion of tears may well explain why the negro is so much safer from infection with the particular parasite that causes trachoma than we are.

Discussion on paper read by DR. B. E. FRYER, of Kansas City, Mo., entitled "*The Antiseptic Preparation of the Conjunctiva for Cutting Operations on the Eyeball*," which appeared in the April number of this journal.

DR. C. D. WESCOTT (Chicago).—I have nothing to criticise in the paper just read. Of course each one of us believes that his own method is best. I simply want to say that I secure ideal healing, after cataract and other operations upon the eye, without the use of any germicide whatever, although I have no

doubt all of you have had equal success. My operations are almost all done in a private operating room where nobody else operates, and where I have absolute control of everything. Many of my patients who present themselves for cataract and other similar operations come in from the country, wishing to go home as soon as possible. I frequently operate on the following day after first seeing the patient. The patient takes a general bath and the head is thoroughly scrubbed the night before the operation. Then, half an hour before operation, the face is scrubbed with soap and water, and just before making the operation I use either cocaine or holocaine. I, personally, scrub the lids, the brows and lashes with a warm solution of boric acid. My nurse has previously done the same thing with soap and water. Then I flush the conjunctival sac several times with a warm solution of boric acid. I use Dr. Grüning's fountain vessel from which we can pour a small stream. I do not believe that boric acid is anything more than an inhibitory antiseptic, if it is that. The eye is dressed after the cataract operation every two days only, and on the sixth or eighth day the bandage is discarded. I frequently see cases which show no congestion, and very often the lids are not gummed together, if I make my dressing every two days. Where, before operation, there has been a slight congestion of the conjunctival sac, I am in favor of applying a dressing each day, and using a little sterilized vaseline to prevent gumming of the lids. As a dressing I use two or three layers of borated gauze applied against the lids, and over that borated cotton and a mosquito-bar bandage. I have been dressing eyes in this way for the past five or six years, and have no cause to regret it. I have at times, however, regretted the use of bichloride solutions even in the strength of 1 to 6,000 because I have irritated the conjunctiva by it.

DR. KNAPP (New York).—The Doctor speaks in general terms that he is satisfied with his results. He gives us no statistics. It would be interesting to know how many cases of suppuration he has had, if any, and under what conditions.

DR. W. L. DAYTON (Lincoln, Neb.).—The question asked by Dr. Knapp is very pertinent, and reminds me that the only case of cutting operation on the eyeball followed by suppuration which I remember of having had, was one in which I used a 1 to 10,000 bichloride solution. Like Dr. Wescott, I rely

almost solely upon the warm boric acid solution, and I can not recall now a case in which I ever have had suppuration of the eyeball. This may seem to you a little egotistical, but I do not remember of having had a single case of suppuration or panophthalmitis following a cutting operation under my rigid asepsis. I follow the usual procedure in these cases of cleansing the face, brows and eyelashes thoroughly before irrigating the conjunctival sac. In cases of conjunctivitis, or of any trouble with the sac, I use a bichloride solution, but in office work and in the hospital I rely entirely upon boric acid. I have tried formalin somewhat, but have not been pleased with its action. In all cutting operations upon the eye I use a bandage in the place of isinglass or plaster strips, or anything of that kind. I have not progressed sufficiently to dispense with bandages. Whether boric acid solution is a bactericide is a question. So long as results are good, I do not care to find any better solution for preparation in eye operations.

DR. A. ALT (St. Louis).—While I agree with what Dr. Fryer has stated in his paper, and while I always use a bichloride solution, I do no longer use it 1 in 5,000-6,000, but 1 in 10,000, and I am perfectly satisfied with that. I have had two cases in old people in which suppuration followed cataract extraction after I had used bichloride solution of 1 in 5,000. Both of these cases occurred in hospital practice and I had thought everything was extremely favorable. One of them was an old physician, for whom I did everything I could possibly think of. My instruments and bandages were thoroughly sterilized. Myself, the nurse, the bed and the room were all thoroughly sterilized, and yet suppuration took place. I then became convinced, that on account of the extreme age of the patient, the caustic effect of the bichloride in this strength was probably too much and caused necrosis of the tissue. However, we know, that in spite of all our antiseptics or chemical agents,—in spite of washing our instruments and rendering them thoroughly sterile, suppuration sometimes takes place; that germs remain in the conjunctival sac, and that we can not guard against infection from the nasal passages.

I would like to know whether any of the gentlemen are acquainted with, or have tried to leave the eye absolutely unbandaged after cataract extraction. Two papers have been published recently on this method. One by Hjort, a Scandina-

vian oculist, in which a series of some fifty cases are reported. He stated that healing was natural and as kindly as possible. Suppuration never followed, but he had in one or two instances prolapse of the iris. The other practitioner is an oculist in Darmstadt, Germany, who published a series of sixty cases in which he had the same results. He, however, places a wire gauze mask over the eyes. He reasons, that the natural flow of normal tears has an excellent bactericidal effect, and that by not interfering with this natural secretion this action remains unimpaired and prevents infection.

DR. J. M. BALL (St. Louis).—I believe one source of infection in cataract operations is the condition of the sweat glands. I am led to this view by an unfortunate case that I had last summer where, after taking all the usual precautions, the wound became infected. For several days following the operation the weather was extremely warm and the patient was perspiring freely. I would like to ask some of the older members of the Association if they make it a practice to operate on cataracts in hot weather. In this case, I spoke of, the usual precautions were taken. Everything was boiled, the patient thoroughly scrubbed, and the conjunctiva washed with a 1 to 4,000 bichloride solution. There was no nasal trouble and no trouble with the lachrymal apparatus, and I do not know the source of infection unless it came from the sweat glands. Whenever patients will submit to it, I have the eyebrows shaved in order that the parts may be thoroughly scrubbed. You can not remove the cilia, but I believe that sometimes it would be a good thing if we could do so. Certainly, in many instances, it is a difficult matter to clean the eyebrows thoroughly unless we shave them.

DR. ALT.—I will say in answer to Dr. Ball's question that the oculist in Darmstadt referred to pulls out all the eyelashes previous to operating for cataract.

DR. A. E. PRINCE (Springfield, Ill.) —A thought occurred to my mind a short time ago, and I will express it in the hope that Dr. Knapp may give us his opinion with regard to it. All that has been said and written with regard to the preparation of the eye preliminary to cataract extractions or operations on the eyeball has reference to rendering the conjunctival sac antiseptic. A case occurred in my practice recently which led me, more than any other one thing I can think of now, to the

opinion, that we ought to devote ourselves to another kind of preparation of the conjunctiva, and that is, the preparation of the intra-vascular circulation of the conjunctiva and the preparation of the nutrition of the patient. We should examine these patients with reference to the condition of the blood. The case I have reference to is this. I made an operation for entropion, and following it there was considerable swelling about the tissues of the lids. I thought the swelling would go down and healing would take place in a short time. I gave the matter less attention than I should have done, and three days after my operation a corneal ulcer developed. It was an old case of trachoma. It was entirely healed, and the cornea had been normal. This ulcer was serpiginous in character, and finally the center of the cornea became smoky. I expected to lose the eye. As a matter of desperation I gave the lady three grains of quinine and ten drops of tincture of iron every three hours. I gave her also one sixtieth grain of strychnia to increase the action of the heart. Upon investigating the previous history of the case I found that she had had boils, having had seven on one arm. At the time I operated she seemed to be a well woman, and I had operated without asking any questions. Fortunately the treatment—I do not know which to attribute it to—improved the condition. The wound in the skin of the lid had shown no tendency whatever to heal. After fortifying her system with the internal medicaments the wound assumed a healthy condition, nutrition was established, the wound healed, and the cornea was saved.

This may seem a digression from the subject under discussion, but I want to bring up the point, that we should look to the condition of nutrition of the individual upon whom we operate. Whether we use bichloride of mercury or a warm boric acid solution, or the biniodide of mercury, if the intra-vascular circulation of the conjunctiva is not in good condition the cornea may slough. If the micro-organisms enter the wound and the condition of the blood is such that it is not phagocytic, the cornea will slough and we will have trouble. I think we should look after the nutrition of the patient and make it as important a part of the preparation as irrigating and dropping in solutions and antiseptics for several days in advance of the operation.

DR. L. R. CULBERTSON (Zanesville, Ohio)—I have not

used bichloride of mercury except for sub-conjunctival injections. I always use a formaldehyd solution in the strength of 1 in 3,000-6,000, and thoroughly irrigate the lids, eyelashes and eyebrows. Before operating I inquire as to whether there is a rheumatic or gouty tendency, or whether there is any tendency to diabetes, and if there be such a tendency I regulate the diet accordingly. If there is a rheumatic or gouty tendency I give my patients the salicylate of strontium, which is one of the most valuable salicylate, and in this way, as far as possible, I avoid trouble from uric acid and its effects. Shutting off all starchy food and sugar will lessen the danger of inflammation when there is a diabetic tendency.

A MEMBER.—Dr. Prince struck a sympathetic cord in me. Instead of putting bichloride of mercury into the conjunctival sac I have found it excellent practice to have the patient take it internally. During the last four or five years I have used no solutions of any kind within the conjunctival sac if it be healthy, and also if there be no disease of the lachrymal apparatus, or nasal trouble. I have paid a good deal of attention to the preparation of the patient, and have followed out the suggestion given in a little manual by Gould and Pyle, of administering a mixture of bichloride of mercury and iodide of potassium, syrup of sarsaparilla and water, so that the patient gets in the neighborhood of one twenty-fourth of a grain of bichloride of mercury for two days prior to the operation, leaving the eye and conjunctival sac entirely alone. It has occurred to me from personal experience that we are liable to, and oftentimes do, irritate the conjunctival sac in our attempts to render it aseptic. This irritation no doubt has been the starting point of infection in many cases, which, after the operation, has ruined all the work that we have attempted to do for the patient. If, by proper preparation of the patient prior to operation, we can avoid the use of antiseptics in the eye, we have at least gained one good point, that is, we have certainly not added any additional irritation to the eye in our attempts to render the conjunctival sac aseptic.

DR. A. C. CORR (Carlinville, Ill.).—The remarks of the last speaker are interesting, but I do not think he sufficiently emphasized the points that were brought out. Reference has been made to the nasal apparatus—to see that it is all right. Now, it takes a great deal of insight and close examination to

see whether this is all right or not, and even though you may spray out the nasal cavity and wash out the conjunctival sac, there are germs enough left to infect the eye in a day or two, or soon after the operation. I simply rise to emphasize the particular point, that if you could slit up the canaliculus and nasal duct into the nose and plug it up from below, and keep it so until the corneal surface is healed, it would be an admirable plan.

I believe the point mentioned by Dr. Prince is one of great importance, namely, that we have lost sight, in our ardent zeal after mere antiseptic preparations, of the importance of paying particular attention to the nutrition of our patients in connection with operations upon the eye. Patients with an impoverished condition of the blood do not recuperate very rapidly after surgical operations upon the eye, and consequently it is important for us to bear in mind the nutrition of the patient.

DR. FRANCES DICKINSON (Chicago). — I am very much pleased with Dr. Prince's constitutional treatment in these cases. I think boric acid and the bichloride of mercury treatment have their places, but I doubt if it is wise for us to use any one of them exclusively in all cases. Before operating on the eye it is always wise to examine the patient's urine. When the processes of elimination are not carried on properly the quality of the blood is injurious to the eye and retards repair. Recently a case came to me in which there had been acute blenorrhœa of ten days' duration. The patient was 35 years of age, and the entire cornea was in a sloughing condition. Patient had applied poultices before seeing any physician. The bulbar conjunctiva was badly swollen and pus secretion abundant. I asked no questions as to its origin, but simply examined the pus. Gonococci were abundant. At the end of ten days no more gonococci were to be found in the eye, but simply streptococci. Before I saw the case bichloride of mercury solutions were used as well as nitrate of silver. After the gonococci had disappeared I used no more nitrate of silver. In spite of loss of the entire cornea, the uncovering of the iris and the softening of the eyeball, the ball is now becoming hard and a new structure is forming entirely over the iris. Before this new tissue from the sclero-corneal margin reached the pupil the patient could count my fingers at one foot and the lens was not opaque. The new growth covers the pupil

and is becoming white and opaque. I simply used boric acid solutions for cleansing the conjunctival sac and at no time used any pressure bandage whatever, but kept a light, wet and warm absorbent cotton pad constantly on the eye. The eyeball is saved.

DR. H. KNAPP (New York).—It is with some reluctance that I comply with your wishes to say a few words on this subject. The majority of cases of cataract I have lost were lost by bad operations, the fault being on my part, and no one here has touched upon this point. I have lost more cases from one fault than all the rest, and that is insufficient section. I have produced septic conditions by so doing. Every oculist who has operated a great deal for cataract must necessarily be of the same opinion. I see about one-half of one per cent. of suppuration in my cases. Last winter I had one hundred and eleven extractions from October till now, and there was one case of suppuration, the eye was lost. It was a case of suppuration of the iris. I have abandoned almost all antiseptics, and I simply endeavor to keep the eyes of my patients thoroughly clean. If a patient has conjunctivitis, or anything of the kind, I refuse to operate on him until this condition is cured. I do not bandage the eye, as I am inclined to think that it brings about congestion. In these cases we can not sterilize the conjunctiva completely, but nevertheless we will get good results in most of the cases from operative interference. A healthy man stands a much better chance for a prompt recovery than one whose nutrition or vitality is lowered. The case I lost this winter was a gentleman, 91 years of age. I operated upon him, as far as I could see, without any fault whatever in technique. After the section the eye was completely collapsed, like a wet cloth. The lens came out completely, yet there was an angular folding of the whole eye. The next day I found he had some irritation and two days later an inflammatory condition which I thought would be a purulent iritis. The iris was greatly swollen and the pupil was filled with yellowish material. I at once opened the wound and let out what matter there was in the anterior chamber. I did this daily, and in this way the eye got well. He left three weeks after the operation, there being not a particle of sloughing of the cornea, but there were evidently deeper changes and the perception of light was poor. If I should get, in the

future, a case of the same kind in an extremely old patient, who showed no power of resistance, I would inject physiological warm salt solution so as to restore the parts to their natural position. The cases in which suppuration took place were those in which I made an insufficient section. I consider a clean operation, where the wound and everything is in the best condition, more important than the use of antiseptics.

DR. ALBERT HALE (Chicago).—We seem to follow in the line of the obstetricians in our attempt to disinfect the mucous membrane around the eye, and we can not do it any more than the obstetrician can disinfect the passages for the birth of the child. In my obstetrical studies in Prague we were taught that it was a difficult matter to render the vagina aseptic, and students who are now coming back from there say that no effort is made in normal cases to disinfect the vagina. It is left to Nature and the normal secretions, and why should we not leave the conjunctiva alone? Of course, my remarks do not apply to cases of conjunctivitis or any condition similar to it, but I mean a healthy eye that comes to us for operation. The result of an operation will be better if the eye is not previously irritated by agents with which to obtain asepsis. If we take a lesson from obstetricians in this particular it will be valuable to us.

DR. FRYER (Kansas City, Mo.).—I believe there are many cases in which the wounds heal after cutting operations without any germicides. I believe it is so in the majority of cases. But the loss of a single eye is a serious matter. We can not tell in any case whether an eye is infected or not without making a microscopical examination of the secretions, or putting on a dressing and watching it. I have been misunderstood in regard to the dressing after operations. I generally allow the patient to go forty-eight hours after the first dressing. This can be done if the operator is careful in his antiseptic work.

In regard to solutions there is a great deal of carelessness on the part of druggists in making these preparations. You may order 1 to 5,000 or 1 to 10,000 and they make it double the strength. These solutions must be correctly made. I recall a case that I had within a month. My operation was clean and the man had been prepared two weeks before operation, but at the end of the fifth or sixth day the bandage was taken off and he rubbed and scratched his eye. I charged him with

doing something of the kind, but he denied it. I examined the eye carefully and found that the wound was partly open. The eye was infected and I found in the anterior chamber a small quantity of pus. I applied an antiseptic dressing, shortly after which the pus disappeared. I have rarely seen any of these cases of pus in the anterior chamber without serious results following them.

Dr. Dayton and others spoke of boric acid. Careful experiments by bacteriologists show that boric acid is inert as a germicide. You will remember that I alluded to cases in my paper with prostatic trouble. In old men with prostatic trouble, upon whom we operate, we should examine the urine for albumen and sugar in every case. We should know whether the patient has diabetes or renal trouble. We ought to know this before we operate, particularly as the general condition of the patient has an important bearing on our operative procedures.

Dr. Ball spoke of the sweat glands as being a source of infection of interfering with healing of the wound. We should look out for that.

Dr. Prince speaks of the importance of looking to the general nutrition of the patient and the condition of his system. I agree with him, and I believe every careful oculist does that. I would not have operated on Dr. Prince's case at all, nor would he have done so if he had known the patient had had boils. Boils are indicative of a depressed condition which we must correct before we operate upon the eye.

Dr. Knapp has alluded to insufficient section in these cases. I think probably I have seen as many of Dr. Knapp's operations as any one present, and I should say that they are simply perfection, and that his technique could not be in any way responsible for the failures he mentioned.

Discussion on paper read by DR. C. BARCK, of St. Louis, entitled "*Extraction of Immature Senile Cataract*," which appeared in the May number of this journal.

DR. A. ALT (St. Louis).—I perfectly agree with the Doctor in regard to the possibility, and sometimes even the moral demand of extracting immature cataracts. I have done so in a large number of cases and never have had to regret it.

The Doctor, in his paper, I believe stated that Hirschberg was the first to recommend the extraction of immature cataract. As far as I remember it was Schweigger who emphatically stated, that after the age of 55 or 60 years immature cataracts may be safely removed. We must not extract immature cataracts in subjects too young. Immature cataracts have undoubtedly been always extracted, although not systematically. Dr. Knapp told the story long ago of a British surgeon who extracted immature cataracts, and when asked, why he did it, replied: "If I do not operate on them, they will go to somebody else." This is, of course, not the proper standpoint from which to look at the matter, but it doubtless has always had some influence with certain operators.

I am fully in accord with the Doctor, that in people of from 55 to 60 years of age immature cataracts can be extracted smoothly and as perfectly as mature ones, often without leaving any cortical substance behind. In some cases, I think, we may even expect better results from the extraction of an immature cataract than if we wait longer. The patient being younger when we operate, is healthier and more active, and his recuperative powers are consequently greater. It is particularly in patients who have to earn a living for themselves and their families that I operate as soon as the dimness of the lenses is sufficiently advanced to take away the chance of earning the necessities of life. To keep such patients waiting until the cataract is ripe is, it seems to me, downright cruelty.

DR. DUDLEY S. REYNOLDS (Louisville).—The subject of extraction of immature cataract is one of great importance. I have a professional brother who has had a zonular cataract for many years in the left eye. The entire posterior surface of the lens has been opaque for more than a year, while in the anterior portion of the lens there is a little opaque matter limited to the anterior cortex. In the nuclear part of the lens is a mass resembling a snowball in whiteness surrounded by normal transparent lenticular substance. The question arises, shall this lens be extracted? As you know, in many cases of lamellar cataract the capsule participates. We may have capsular opacities before the lens is involved. I think that as long as a person has the capacity to read with the fellow eye, it should be let alone. The moment he is not able to read with the other eye, then I should resort to extraction, with the under-

standing that almost certainly a subsequent needling operation of the opaque capsule might have to be made. But I should not care to extract such a lens through a normal pupil; I should prefer to supplement it by an iridectomy. In the extraction of immature cataracts, whether zonular or nuclear, the operation should not be done through a normal pupil, because it is certain that a large amount of cortical substance will be retained in the capsule. No harm will, however, result if the amount is not large, and if the eye is protected by an iridectomy. I am sure that if this be not done there will be some harm done to the ciliary region, and this may bring on an attack of glaucoma, and a glaucomatous attack after the extraction of an immature cataract is a dangerous complication. It will not occur if the extraction is preceded by an iridectomy.

DR. C. BARCK (St. Louis).—I have little to add. As to the remark made by Dr. Alt, I am not aware Dr. Schweigger ever took the position that Hirschberg did in the extraction of immature cataract. As to iridectomy, I have stated that in all of my cases an iridectomy has been performed, and that I have never gone so far as to remove an immature cataract without an iridectomy.

Discussion on paper read by DR. A. E. PRINCE, of Springfield, Ill., on "*Excision of the Tarsus for Extreme Non-Cicatricial Ectropion of the Lower Lid*," which appeared in the May number of this journal.

DR. E. A. KEGLEY (Cedar Rapids, Iowa).—I would like to ask Dr. Prince if, when making excision of the tarsus, he at the same time opens the tear duct.

DR. A. E. PRINCE (Springfield, Ill.).—Yes, sir.

DR. J. P. WORRELL (Terre Haute, Ind.).—The Doctor's paper calls to my mind a case upon which I operated some two years ago. The patient applied to me for cataract operation. There was extreme ectropion, the result of a neglected purulent ophthalmia. My operation differed from the Doctor's in that I did not sacrifice the tarsus. I made an incision parallel to and at perhaps 5 millimeters from the margin of the lid, and followed it by another line parallel to it, and these two incisions were united at the inner and outer canthus. In this way I removed a wedge-shaped mass, and even without put-

ting in any stitches, I held the lid in place and had an admirable result. Opening of the canaliculus was made preliminary to the operation.

DR. PRINCE.—I hope the members will think sufficiently well of this operation to give it a trial. I attribute the good results to the cicatrization. The tarsus, when it becomes misshaped and hypertrophied, crowds the lid outwards, and if we remove a portion of it sufficient to have cicatrization lengthwise parallel with the margin of the lid, we are bound to have a good result.

MISCELLANY.

INSUFFICIENCY OF THE OCULAR MUSCLES.

In a paper on "Operation for Insufficiency of the Ocular Muscles," A. Duane (*N. Y. Med. Jour.*) formulates the following conclusions as to what conditions they may relieve:

1. An obvious disfiguring deflection of the eyes and the often annoying diplopia that such a deflection may give rise to. The term diplopia, I may add, includes not only the pronounced form in which the objects appear frankly double, but also the slight intermittent form in which the double images are not distinctly separated, but overlap, and at times are fully united, at times spread apart again. This latter variety of diplopia produces great confusion of sight, particularly in reading, when the slight overlapping of the letters causes the print to look blurred, as though the types had slipped.
2. Pain in using the eyes and asthenopia; a sense of weariness and strain preventing the patient from using his eyes for very long at a time.
3. Headache, migraine, and other reflex pains (not infrequently referred to the occiput or spine).
4. A sense of constant confusion in the head and of dullness, causing aprosexia and mental hebetude and depression.
5. Vertigo.
6. Digestive disturbance, with impairment of appetite and nutrition and subnormal body weight.
7. Chorea (rarely).

PAMPHLETS RECEIVED.

"Iodoformogen," by E. Kromayer, M.D.

"Diet for Consumptives," by R. W. Wilcox, M.D.

"Dermoid Cyst of the Orbit," by H. Moulton, M.D.

"Primary Syphilis of the Tonsil," by M. Thorner, M.D.

"Primary Tuberculosis of the Rectum," by Dr. L. Straus.

"The Surgery of the Gall-Bladder and Its Ducts," by H. O. Walker, M.D.

"Some Fads and Fallacies of Modern Rectal Snrgery,"
by L. Straus, M.D.

"Thiosinamine—A Clinical Contribution to Its Study,"
by G. F. Suker, M.D.

"Vicious Reading Distance a Cause of Asthenopia," by
Ch. H. Thomas, M.D.

"Some Personal Observations in Abdominal Surgery,"
by H. Tuholske, M.D.

"The Histology of the Glands of the Stomach," etc., by
J. C. Hemmetter, M.D.

"Serious Complications of Suppuration of the Middle
Ear," by M. Thorner, M.D.

"Some Experiments on the Assimilation of Diphtheria
Antitoxin," by C. Fisch, M.D.

"Twenty-Eighth Annual Report of the St. Louis Insane
Asylum," by E. C. Runge, M.D.

"Uncommon Accidents Following Operations in the Nose
and Throat," by M. Thorner, M.D.

"The Use of Pilocarpine in Some Acute Infectious Dis-
eases," by E. W. Saunders, M.D., J. Zahorsky, M.D., and C.
Fisch, M.D.

"The Report of an Unusual Contraction of the Visual
Fields and Disturbance of the Color-Sense Following an In-
jury," by T. F. C. Van Allen, M.D.